ASD Weekly Highlights for the Week Ending 8-Sep-2006

Operations

There was no beam operation from September 1 through 8. Therefore Operatinos recorded 168 hours of Programmed Shutdown,

Andy Arvin is working with the Ion Source Group
Saul Matovu, Charles Peters, Vaughn Patiana and Roger Housman are working on Datastream.
David Brown is working with Diagnostics and Controls
Jennifer Kozak is working on Controls Screens and scripts.
Bill Krapf is working with Ted Williams on Training
Louis Rupp, Zafer Kurson, Ben Sanchez, Nic Luciano and Larry Longcoy are staffing shifts

Accelerator Physics

- During the last week of beam running in August, a proof of principle experiment successfully demonstrated double stripping of H- to H+ using laser light. The stripping was ~ 85-96% complete during the period the laser was on. This was the first time complete stripping with a laser was demonstrated and is the first step towards eliminating the need for using foils in the Ring injection.

- Analysis of beam loss during the July-August period indicates substantial loss reductions during this period and that clean operation at 10 kW should be possible.

RF Systems

- Accelerator maintenance is in progress. We do not foresee any problems in finishing the necessary work during September.
- Preparation of the RF components of the cryomodule test facility is ongoing as 2nd priority to maintenance.
- The terms and conditions of the klystron spares procurement have been finalized. We hope to issue the purchase order within 1-2 weeks depending on availability of funding and final review by Procurement, Compliance, OGC and DOE.
- We are reviewing resumes of candidates for the RF Technician posting and plan to begin interviews later this month.
- During this maintenance period we are concentrating on cleaning up some installation problems and replacing the RediPanel local control panels with updated Touch Screens.
- We had one part of an Allen-Bradley Block IO unit, used to operate indicator lamps on the final amplifier module for Station RF-12, fail and are replacing this unit. Since the Block IO devices are no longer available we are replacing it with a

Flex IO unit similar to the units used elsewhere throughout the system. We will ultimately need to replace all the Block IO devices.
- We are preparing to measure various cavity/amplifier parameters and intend to carry out LLRF control system tests to the extent that other maintenance work permits.

Ion Source

- The new LEBT for the SNS PUP will feature a solenoid to focus the H- beam into the RFQ. Recently we reported on calculating the Twiss parameters that need to be matched at the chopper entrance to properly match the beam into the RFQ in the presence of the beam's space charge. Now we have calculated the maximum beam size of a neutralized H- beam inside the solenoid as a function of the distance between the chopper and the solenoid, with the beams matching the previously calculated Twiss parameters at the chopper entrance. Four cases were studied: a 0.2 Pi-mm-mrad, 60 mA and a 0.35 Pi-mm-mrad, 100 mA beam each for a chopper length of 60 mm and 100 mm. The results show that a beam's 5-sigma ellipse does not exceed 50% of the solenoid bore radius as long as the gap between the RFQ and the solenoid do not exceed ~120 mm.

- The parameter list for the 2-source LEBT has been relaxed to reflect these new results: The chopper length was increased from 28 mm to 60 mm, which allowed for restoring the chopper voltage back to 3 kV. The gap between chopper and solenoid field was increased from 20 to 40 mm, which yields a 100 mm gap between the RFQ and solenoid face. The dipole magnet bend was reduced from 60 to 45 degrees, to reduce spatial interference pointed out by Ted Hunter. Ted will recalculate the revised dipole magnet.

- Dr. Baoxi Han was in town to pass his pre-employment physical and look for an apartment. We are looking forward to October 2, when he will officially join us. Dr Han will initially work on the PUP LEBT design, an area where he has substantial experience. We feel honored that he accepted our offer over an offer from the University of Glasgow.

- Andy Arvin has started to help us with ion source test stand, where testing is in full swing.

Instrumentation and Controls

- Planned power outages at the Ring Service Building resulted in the failure of the control system network ("DeviceNet") that controls building air handler fans and water pumps. Troubleshooting efforts seemed to isolate the problem to particular node on the network, but in the end we were unable to reproduce the failure. We did however manage to get the network back up and running again. To make us

less vulnerable in the future, we plan to re-examine the network architecture to make sure we haven't violated any rules in its construction. Also we will work towards allowing the air handler units to control temperature even with DeviceNet down (i.e. with the fan control switch in "hand").

- Work continues on the ChoMPS system. We successfully tested the comparator card that we had built last week. The MPS output board schematic is now complete, and we are currently doing parts placement on the board layout

- Assembly of additional differential gate interfaces for spare LEBT Chopper Switches was completed.

- Maintenance activities continued in the Target facility. The controls interface to the new proton beam window vacuum system pumps was installed and tested. In the GLS cavity a faulty differential pressure transmitter was replaced and connector problems were fixed. Testing of the newly-installed H2/O2 analyzer system is in progress.

- Installation of RFTF test cave cryo and vacuum controls continued.

- With the return of personnel from HIFR, work has resumed on cleaning up alarm handling for conventional facilities systems. Alarm handler problems were fixed for the Central Exhaust system, the tower water system, etc.

SRF Facility

SRF Task Force

Survey and Alignment

Cryo Systems

Mechanical Systems

- ~40% Complete on SCL/PS-KL-02 Gaskets & Bolting Work
- HEBT-SB/PS-HS-01 Gaskets & Bolting Complete
- Fabrication of flow bypass leg for the HEBT-SB ~15%
- PS-RN-01 Isolation Valves ~90%
- RSB Make-Up Water systems complete
- RTBT-SB Make-up water system complete
- RTBT-SB Gaskets/bolting Complete
- FEB Chiller installation is ~20% complete
- Started the WPP for the Ring Drain Tasks for the end of the month
- Ordered the 1st O2 Removal Membrane systems for testing

Electrical Systems

- Finish Pin Swap for Target Service Bay Turbo Pump VACP-1000
- Finish Initial Mercury Pump ESA Measurements for Target
- Finish Vacuum Gauge 6010 Installation in HUR. (Target)
- Finish Helium Purge Control Valve 6018 in HUR. (Target)
- Complete Target Gas Analyzer Installation.
- Replace Cooling Fan Connections in Target Service Bay.
- Repair PLC for Air Handling System in Ring Service Building.
- LOTO of HEBT / RING / RTBT for Maintenance
- LOTO and Cover Removal for CCL Magnets required for Survey.
- LOTO and Cover Removal for SCL Magnets required for Diagnostics.
- LOTO of DI Pump Systems (4) for Mech. Maint.

- Completed substation maintenance on Ring Service substations (RN-SS1, RN-SS2, RN-SS3, RN-SS4)
- Completed substation maintenance for the HEBT Building (HE-SS1)
- Completed 13.8kV vacuum breaker maintenance for Ring Service Building main ring dipole
- Completed 13.8kV vacuum breaker maintenance for 13.8kV Feeder 2074
- Completed Ring Service electrical panel maintenance fed from substation RN-SS3

- Completed installation of 73% of Rogowski units in modulator systems
- Disassembled MEBT chopper structures and found numerous problems with system. Evaluating options.
- Operated DTL-Mod1 to support RFQ chiller testing and troubleshooting modulator problems. Scheduled maintenance on this system will have to be extended to address a "new" problem inside the oil tank.
- Completed assembly of new gate drive switch plate assembly for testing next week.
- Tested MOSFET gate drive for next generation LEBT chopper pulser prototype. Concept is sound and we can now proceed with the mechanical layout of chassis, final design of printed circuit boards.
- Completed MPS interface box for LEBT overcurrent indication.
- Ordered vacuum relays to crowbar LEBT choppers in the event of a vacuum overpressure event.